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REMARKS

Claims 1-20 are pending in this application.

Applicant gratefully acknowledges the Office Action's indication of allowable subject matter in claims 4-7 and 13-16. However, for the reasons set forth below, Applicant respectfully asserts that all of the claims are directed to allowable subject matter and that the application is in condition for allowance.

The Office Action maintains the rejection, under 35 U.S.C. § 103, of claims 1-3, 8, 9, 11, 12, and 17-20 over Bourmeyster et al. (U.S. Patent No. 5,680,393) and Yoshida et al. (U.S. Patent No. 5,617,472) and claim 10 over Bourmeyster, Yoshida, and Liu et al. (U.S. Patent No. 6,108,412). These rejections are respectfully traversed.

Applicant maintains that Bourmeyster and Yoshida do not disclose or suggest determining an order of noise suppression and echo cancellation based on the noise in a received signal, as recited in independent claim 1, and similarly recited in independent claim 9.

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the reference or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine the reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art references, when combined, must teach or suggest all of the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure (MPEP 2142). The prior art must suggest the desirability of the claimed invention (MPEP 2143.01).

In the Response to Arguments section, Office Action alleges, "The word order has several distinct meanings including 'arrangement or sequence of events in time,' 'degree,' or 'command.'" Applicants disagree. In particular, the Office Action has not cited any foundation for such a definition of the word "order."

Furthermore, Applicant asserts the Office Action is attempting to import improper meanings to the term "order." In particular, in accordance with MPEP § 2111.01(I), "Words of the claim must be given their plain meaning unless applicant has provided a clear definition in the specification." Applicant asserts the word "order" is clearly defined in the specification at

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page 5, lines 7-20 and page 7, lines 19-29. In particular, these sections of the specification clearly delineate that the word "order" defines performing echo cancellation prior to noise suppression or noise suppression prior to echo cancellation.

Additionally, if the Office Action is attempting to use a dictionary definition, Applicant notes that MPEP §2111.01(II) expressly states, "If extrinsic reference sources, such as dictionaries, evidence more than one definition for the term, the intrinsic record must be consulted to identify which of the different possible definitions is most consistent with applicant's use of the terms. *Brookhill-Wilk 1*, 334 F. 3d at 1300, 67 USPQ2d at 1137; see also *Renishaw PLC v. Marposs Societa" per Azioni*, 158 F.3d 1243, 1250, 48 USPQ2d 1117, 1122 (Fed. Cir. 1998) ('Where there are several common meanings for a claim term, the patent disclosure serves to point away from the improper meanings and toward the proper meanings.')" Thus, Applicant asserts the Office Action is attempting to import improper meanings to the term "order."

The Office Action goes on to allege, "Because the combination of Bourmeyster and Yoshida controls the noise suppression function, it inherently produces a 'command.'" Applicants disagree. In particular, aside from the fact that the references are not properly combinable to achieve the claimed invention, there is no basis for inherently providing a "command" in the combination of the references. For example, neither reference discloses determining an order of noise suppression and echo cancellation based on the noise in a received signal. Yoshida only controls a noise canceller based on noise level. There is no basis for inherently producing a command for controlling both noise suppression and echo cancellation based on noise in the received signal.

Additionally, defining the word "order" to mean "command" is contrary to the plain meaning of "order" in the context of the claim language. In particular, the claim expressly recites "determining an order," which grammatically necessarily results in a sequence of events. To the contrary, if "order" were construed to mean "command" in the context desired by the Office Action, the proper use of such a phrase would be "issuing an order," which is not recited in the claims. Thus, defining the word "order" to mean "command" is contrary to the plain meaning of "order" in the context of the claim.

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The Office Action goes on to allege, "Further, because the combination of Bourmeyster and Yoshida turns the noise suppression function on and off, it inherently determines a 'degree.'" Applicants disagree. Regardless of whether "degree" is an improper definition of "order," the allegation does not amount to "determining an order of noise suppression and echo cancellation." In particular, the allegation only results in a degree of noise suppression, not a degree of noise suppression and echo cancellation. Therefore, the cited references do not disclose even what is alleged by the improper definition of the word "order."

The Office Action then goes on to allege, with respect to claims 1, 9 and 19, "In addition, even the 'arrangement or sequence of events in time' interpretation does not limit the claim to determining whether to either perform noise suppression on the signal and subsequently perform echo cancellation on the noise-suppressed signal or perform echo cancellation on the signal and subsequently perform noise suppression on the echo-canceled signal since it could just as well apply to performing echo cancellation alone during a first time period and noise suppression, either with or without echo cancellation during a second time period.' Applicants disagree.

Applicants assert the alleged definition does not result in the claimed combination. In particular, the Office Action alleges it could just as well apply to performing echo cancellation alone during a first time period and noise suppression, either with or without echo cancellation during a second time period. However, the cited references do not disclose performing one sequence during one time period on a signal and performing another sequence during a different time period on the same signal. More particularly, the claim expressly recites receiving a signal at an input to the communication device; determining background noise in the signal; and determining an order of noise suppression and echo cancellation based on the noise in the received signal. The cited references do not disclose changing an order based on the same signal nor based on the noise in the signal. In fact, the alleged combination would only result in turning on and off the noise suppression, not changing a sequence in time of both the echo cancellation and the noise suppression.

The Office Action also alleges claim 19 "could just as well apply to performing echo cancellation alone during a first time period and noise suppression, either with or without echo cancellation during a second time period." Applicant disagrees. Applicants assert the Office

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Action is mischaracterizing claim 19, by paraphrasing and ignoring specific features of the claim. In particular, claim 19 <u>does not</u> recite performing echo cancellation alone during a first time period and noise suppression, either with or without echo cancellation during a second time period.

Furthermore, Applicant asserts the Office Action is not properly providing a ground of rejection because the Office Action is attempting to read a paraphrase of claim 19 onto the cited references. However by paraphrasing claim 19, the Office Action implicitly ignores specific elements of claim 19. Applicant asserts this is an improper ground of rejection because the Office Action is not providing an explanation of how the references disclose the specific elements in the claim. The Office Action is only providing a summary of the claim to read the claim on the references. Because a summary or paraphrased claim does not recite all of the claim elements, Applicant asserts this rejection is improper.

In fact, claim 19 explicitly recites specific configurations of performing both echo cancellation and noise suppression based on a noise component in an acoustic signal. For example, claim 19 recites obtaining a noise component in an acoustic signal, comparing the noise component to a threshold, and configuring the order of echo cancellation and noise suppression to perform noise suppression prior to echo cancellation on the acoustic signal if the noise component is above the at least one threshold to obtain a desired signal and the opposite otherwise. The Office Action has not provided a basis in the references for each of these features as recited in claim 19.

The Office Action goes on to allege, "Since the combination of Bourmeyster and Yoshida performs echo cancellation directly on the microphone signal when the noise level is below the threshold but performs noise suppression on a microphone signal to produce a noise-suppressed microphone signal and echo cancellation on the noise suppressed signal when the noise level rises above the threshold, it meets this <u>interpretation</u> of the recitation 'prior to,'" (emphasis added). Thus, the Office Action appears to admit the references do not disclose what is actually claimed because a paraphrased claim 19 must be used. In particular, the references do not read on the specific elements of claim 19. Additionally, Applicant would appreciate the Office

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Action referencing the specific elements of the claim, not "interpretations" that ignore the specific elements.

Furthermore, Applicant maintains the combination of Bourmeyster and Yoshida do not disclose the elements of claim 19. In particular, the cited references do not configure the order based on the threshold in the signal. For example, even if the references were to perform on sequence at one point in time and another sequence at another point in time, this results in performing one or the other independent of what was earlier performed. Furthermore, the alleged combination does not configure the order based on the threshold. In particular, the alleged combination only determines whether to turn noise suppression on or off based on a threshold. This is independent of what was earlier performed and independent of noise being above or below a threshold when a previous sequence was determined. In particular, claim 19 recites configuring the order based on a noise component with respect to a threshold. However, the alleged combination must use two different noise components at two different points in time to allegedly change the order. Thus, the alleged combination does not disclose the features of claim 19.

Applicant's previous arguments are included below for convenience purposes.

Applicant asserts that Bourmeyster and Yoshida do not disclose or suggest adaptively determining an order of noise suppression and echo cancellation based on the background noise in a signal received at an input to a communication device, as recited in independent claim 1.

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the reference or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine the reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art references, when combined, must teach or suggest all of the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure (MPEP 2142). The prior art must suggest the desirability of the claimed invention (MPEP 2143.01).

Bourmeyster discloses a method and device for suppressing background noise in a voice signal and corresponding system with echo cancellation (col. 1, lines 1-11). Bourmeyster

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discloses two embodiments of a combined background noise suppression and echo cancellation system. A first embodiment is included in a terminal and includes a background noise suppression device 1 and an echo canceller 3 (Fig. 3 and col. 6, lines 59-66). A second embodiment of a combined noise suppression and echo cancellation system includes an echo canceller 3, a frequency-domain processing unit 100, and a time-domain processing circuit 14.

Bourmeyster does not disclose an order of noise suppression and echo cancellation is adaptively determined based on background noise in a signal received at an input to a communication device. In particular, Bourmeyster expressly discloses the two embodiments as separate embodiments. There is no disclosure of adaptively determining which of the two embodiments is used or even any benefits of the first embodiment over the second embodiment. Bourmeyster only discloses the second embodiment avoids duplication of the circuit 14 in the branch including the circuit 31 (col. 8, lines 4-6). This only discloses the second embodiment may be preferential to the first embodiment. This does not disclose the adaptive determination of which embodiment to use. Furthermore, this also illustrates how Bourmeyster does not determine an order based on a signal received at an input to a communication device. In particular, the two embodiments are shown as two separate embodiments. There is no disclosure of determining which embodiment to use based on a signal received at an input to a communication device. In summary, Bourmeyster only discloses two design possibilities but does not disclose adaptively determining which one to use based on a signal received at an input to a communication device. Furthermore, Bourmeyster does not disclose any way of switching the embodiments.

Yoshida fails to make up for the deficiencies of Bourmeyster. In particular, Yoshida discloses noise suppression of an acoustic signal in a telephone set (col. 1, lines 1-2). A noise canceler cancels a noise component from a transmitting acoustic signal when a noise level is not smaller than a first threshold (col. 2, lines 8-11). This is not the disclosure of adaptively determining an _order_ of noise suppression and echo cancellation. This is only the disclosure of canceling noise based on a noise level. In particular, Yoshida only determines if noise cancellation is to be used or not. Yoshida does not determine an order of noise suppression and echo cancellation.

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In fact, even if the teachings of Yoshida were combined with the teachings of Bourmeyster, such a combination would only result in two separate design possibilities or embodiments, each embodiment including a noise canceler that cancels noise based on a noise level. The order of noise suppression and echo cancellation would not be adaptively determined.

Furthermore, the Office Action admits on page 3 the combination of the teachings of Yoshida and Bourmeyster would only result in switching between echo cancellation only and echo cancellation with noise suppression. This is only turning noise suppression on or off. It has nothing to do with adaptively determining the order of noise suppression and echo cancellation. In particular, according to the alleged combination, noise suppression would be added or removed and the order would remain the same.

Thus, Bourmeyster and Yoshida do not disclose or suggest adaptively determining an order of noise suppression and echo cancellation based on the background noise in a signal received at an input to a communication device, as recited in independent claim 1.

Applicant also asserts that Bourmeyster and Yoshida do not disclose or suggest an electronic device including an adaptive echo and noise control system that is configured to adaptively determine an order of echo cancellation and noise suppression based on an amount of noise in a received signal to generate a desired signal, as recited in independent claim 9.

As discussed above, Bourmeyster discloses a method and device for suppressing background noise in a voice signal and corresponding system with echo cancellation (col. 1, lines 1-11). Bourmeyster discloses two embodiments of a combined background noise suppression and echo cancellation system. A first embodiment is included in a terminal and includes a background noise suppression device 1 and an echo canceller 3 (Fig. 3 and col. 6, lines 59-66). A second embodiment of a combined noise suppression and echo cancellation system includes an echo canceller 3, a frequency-domain processing unit 100, and a time-domain processing circuit 14.

Bourmeyster does not disclose an electronic device including an adaptive echo and noise control system that is configured to adaptively determine an order of echo cancellation and noise suppression based on an amount of noise in a received signal to generate a desired signal. In particular, Bourmeyster expressly discloses the two embodiments as separate embodiments.

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There is no disclosure of adaptively determining which of the two embodiments is used or even any benefits of the first embodiment over the second embodiment. Bourmeyster only discloses the second embodiment avoids duplication of the circuit 14 in the branch including the circuit 31 (col. 8, lines 4-6). This only discloses the second embodiment may be preferential to the first embodiment. This does not disclose the adaptive determination of which embodiment to use. Furthermore, this also illustrates how Bourmeyster does not determine an order based on a signal received at an input to a communication device. In particular, the two embodiments are shown as two separate embodiments. There is no disclosure of determining which embodiment to use based on an amount of noise in a received signal. In summary, Bourmeyster only discloses two design possibilities but does not disclose adaptively determining which one to use based on a signal received at an input to a communication device.

Yoshida fails to make up for the deficiencies of Bourmeyster. In particular, Yoshida discloses noise suppression of an acoustic signal in a telephone set (col. 1, lines 1-2). A noise canceler cancels a noise component from a transmitting acoustic signal when a noise level is not smaller than a first threshold (col. 2, lines 8-11). This is not the disclosure of an electronic device including an adaptive echo and noise control system that is configured to adaptively determine an <u>order</u> of echo cancellation and noise suppression based on an amount of noise in a received signal to generate a desired signal. This is only the disclosure of canceling noise based on a noise level. In particular, Yoshida only determines if noise cancellation is to be used or not. Yoshida does not determine an order of noise suppression and echo cancellation.

In fact, even if the teachings of Yoshida were combined with the teachings of Bourmeyster, such a combination would only result in two separate design possibilities or embodiments, each embodiment including a noise canceler that cancels noise based on a noise level. The order of noise suppression and echo cancellation would not be adaptively determined. Furthermore, there is no disclosure in either of the references of how the first embodiment could be adaptively manipulated to result in the second embodiment within the same device.

Additionally, the Office Action admits on page 3 the combination of the teachings of Yoshida and Bourmeyster would only result in switching between echo cancellation only and echo cancellation with noise suppression. This is only turning noise suppression on or off. It has

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nothing to do with adaptively determining the order of noise suppression and echo cancellation. In particular, according to the alleged combination, noise suppression would only be added or removed and the order would remain the same.

Thus, Bourmeyster and Yoshida do not disclose or suggest an electronic device including an adaptive echo and noise control system that is configured to adaptively determine an order of echo cancellation and noise suppression based on an amount of noise in a received signal to generate a desired signal, as recited in independent claim 9.

Applicant further asserts that Bourmeyster and Yoshida do not disclose or suggest configuring an order of echo cancellation and noise suppression to perform echo cancellation prior to noise suppression on an acoustic signal if a noise component is below at least one threshold to obtain a desired signal and configuring the order of echo cancellation and noise suppression to perform noise suppression prior to echo cancellation on the acoustic signal if the noise component is above the at least one threshold to obtain a desired signal, as recited in independent claim 19.

As discussed above, Bourmeyster discloses a method and device for suppressing background noise in a voice signal and corresponding system with echo cancellation (col. 1, lines 1-11). Bourmeyster discloses two embodiments of a combined background noise suppression and echo cancellation system. A first embodiment is included in a terminal and includes a background noise suppression device 1 and an echo canceller 3 (Fig. 3 and col. 6, lines 59-66). A second embodiment of a combined noise suppression and echo cancellation system includes an echo canceller 3, a frequency-domain processing unit 100, and a time-domain processing circuit 14.

Bourmeyster does not disclose configuring an order of echo cancellation and noise suppression based on comparing a noise component to a threshold. In particular, Bourmeyster expressly discloses the two embodiments as separate embodiments. There is no disclosure of configuring an order of echo cancellation and noise suppression based on comparing a noise component to a threshold. Bourmeyster only discloses the second embodiment avoids duplication of the circuit 14 in the branch including the circuit 31 (col. 8, lines 4-6). This only discloses the second embodiment may be preferential to the first embodiment. This does not

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disclose the configuration of which embodiment to use. Furthermore, this also illustrates how Bourmeyster does not configure an order based on comparing a signal to a threshold. In particular, the two embodiments are shown as two separate embodiments. There is no disclosure of determining which embodiment to use based on any information. In summary, Bourmeyster only discloses two design possibilities but does not disclose configuring an order of echo cancellation and noise suppression based on comparing a noise component to a threshold.

Yoshida fails to make up for the deficiencies of Bourmeyster. In particular, Yoshida discloses noise suppression of an acoustic signal in a telephone set (col. 1, lines 1-2). A noise canceler cancels a noise component from a transmitting acoustic signal when a noise level is not smaller than a first threshold (col. 2, lines 8-11). This is not the disclosure of configuring an order of echo cancellation and noise suppression based on comparing a noise component to a threshold. This is only the disclosure of canceling noise based on a noise level. In particular, Yoshida only determines if noise cancellation is to be used or not. Yoshida does not determine an order of noise suppression and echo cancellation.

In fact, even if the teachings of Yoshida were combined with the teachings of Bourmeyster, such a combination would only result in two separate design possibilities or embodiments, each embodiment including a noise canceler that cancels noise based on a noise level. The order of echo cancellation and noise suppression would not be configured based on comparing a noise component to a threshold. Furthermore, there is no disclosure in either of the references of how the first embodiment could be configured to result in the second embodiment within the same device.

Additionally, the Office Action admits on page 6 the combination of the teachings of Yoshida and Bourmeyster would only result in switching between echo cancellation only and echo cancellation with noise suppression. This is only turning noise suppression on or off. It has nothing to do with adaptively determining the order of noise suppression and echo cancellation. In particular, according to the alleged combination, noise suppression would only be added or removed and the order would remain the same.

The Office Action goes on to allege "because the combination performs echo cancellation by itself when the noise level is below the threshold and noise suppression when the noise level

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is above the threshold, the combination performs echo cancellation prior to noise suppression
when the noise level is below a threshold." Not only is this statement completely illogical, this
statement is also not supported by the references. In particular, there is no teaching in either
reference that performing echo cancellation by itself results in performing echo cancellation prior
to noise suppression. More particularly, the concept of performing of echo cancellation by itself
eliminates the use of noise suppression. Therefore, the echo cancellation cannot be performed
before noise suppression because noise suppression is not performed. A second action cannot be
performed after a first action when the second action is never performed. By definition, if the
second action is never performed, it is not performed after the first action. Thus, the Office
Action's allegation is both illogical and not supported by the references. This concept holds true
for the rejections of all of the claims.

Therefore, Bourmeyster and Yoshida do not disclose or suggest configuring an order of
echo cancellation and noise suppression to perform echo cancellation prior to noise suppression
on an acoustic signal if a noise component is below at least one threshold to obtain a desired
signal and configuring the order of echo cancellation and noise suppression to perform noise
suppression prior to echo cancellation on the acoustic signal if the noise component is above the
at least one threshold to obtain a desired signal, as recited in independent claim 19.

Therefore, Applicant respectfully submits that independent claims 1, 9, and 19 define
patentable subject matter. The remaining claims depend from the independent claims and
therefore also define patentable subject matter. Accordingly, Applicant respectfully requests the
withdrawal of the rejections under 35 U.S.C. § 103.

CONCLUSION

Based on the foregoing amendments and remarks, Applicant respectfully submits this
application is in condition for allowance. Favorable consideration and prompt allowance of
claims 1-20 are earnestly solicited.

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Should the Examiner believe that anything further would be desirable in order to place

this application in better condition for allowance, the Examiner is invited to contact Applicant's

undersigned representative at the telephone number listed below.

The Commissioner is hereby authorized to deduct any fees arising as a result of this

Amendment or any other communication from or to credit any overpayments to Deposit Account

No. 50-2117.

Respectfully submitted,

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